



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2008-0442; Directorate Identifier 2007-SW-24-AD]

RIN 2120-AA64

Airworthiness Directives; Various Sikorsky-Manufactured Transport and Restricted Category Helicopters

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Supplemental notice of proposed rulemaking (SNPRM); reopening of comment period.

SUMMARY: We are revising the proposals in an earlier notice of proposed rulemaking (NPRM) for certain Sikorsky Aircraft Corporation (Sikorsky) Model S-61A, D, E, L, N, NM (serial number 61454), R, and V; Croman Corporation Model SH-3H, Carson Helicopters, Inc., Model S-61L; Glacier Helicopters, Inc. Model CH-3E; Robinson Air Crane, Inc. Model CH-3E, CH-3C, HH-3C, and HH-3E; and Siller Helicopters Model CH-3E and SH-3A helicopters. The NPRM proposed superseding an existing AD but retaining some requirements of that AD, removing certain dowel pin bores, expanding the applicability to include additional helicopters, and implementing a new retirement life for each main rotor shaft (MRS) based on a reevaluation of the MRS service life. This SNPRM is prompted by the comments received in response to the NPRM and a reevaluation of the relevant data. The proposed actions are intended to prevent MRS

structural failure, loss of power to the main rotor, and subsequent loss of control of the helicopter.

DATES: We must receive comments on this SNPRM by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments by any of the following methods:

- Federal eRulemaking Docket: Go to <http://www.regulations.gov>. Follow the instructions for sending your comments electronically.

- Fax: 202-493-2251.

- Mail: Send comments to the U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590-0001.

- Hand Delivery: Deliver to the “Mail” address between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

For service information identified in this AD, contact Sikorsky Aircraft Corporation, Attn: Manager, Commercial Technical Support, mailstop s581a, 6900 Main Street, Stratford, CT, telephone (203) 383-4866, e-mail address tsslibrary@sikorsky.com,

or at <http://www.sikorsky.com>. You may review a copy of the referenced service information at the FAA, Office of the Regional Counsel, 2601 Meacham Blvd., Room 663, Fort Worth, Texas 76137.

FOR FURTHER INFORMATION CONTACT: Jeffrey Lee, Aviation Safety Engineer, Boston Aircraft Certification Office, 12 New England Executive Park, Burlington, MA 01803, telephone (781) 238-7161, fax (781) 238-7170, email jeffrey.lee@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to participate in this rulemaking by submitting written comments, data, or views. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, commenters should send only one copy of written comments, or if comments are filed electronically, commenters should submit only one time.

We will file in the docket all comments that we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, we will consider all comments we receive on or before the closing date for comments. We will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. We may change this proposal in light of the comments we receive.

Discussion

On April 10, 2008, we issued an NPRM (73 FR 21556, April 22, 2008) proposing to amend 14 CFR part 39 to include an AD for Sikorsky Aircraft Corporation Model S-61A, D, E, L, N, NM, R, and V; Croman Corporation Model SH-3H, Carson Helicopters, Inc. Model S-61L; Glacier Helicopters, Inc. Model CH-3E; Robinson Air Crane, Inc. Model CH-3E, CH-3C, HH-3C and HH-3E; and Siller Helicopters Model CH-3E and SH-3A helicopters. That NPRM proposed superseding AD 98-26-02, published in the Federal Register on December 16, 1998 (63 FR 69177), that only applied to the affected Sikorsky model helicopters. That NPRM proposed retaining some of the requirements of the existing AD but also proposed determining a new retirement life for each MRS, removing from service any MRS with oversized dowel pin bores, and expanding the applicability to include certain restricted category models that were inadvertently omitted in the current AD. That NPRM was prompted by the manufacturer's reevaluation of the retirement life for the MRS based on torque, ground-air-ground (GAG) cycle, and fatigue testing. Those proposals were intended to prevent MRS structural failure, loss of power to the main rotor, and subsequent loss of control of the helicopter.

Actions Since Previous NPRM was Issued

Since we issued the NPRM (73 FR 21556, April 22, 2008), we have determined a need to revise the proposed requirements, based on our review of the data and the comments received. These supplemental proposals are intended to extend the hours time-in-service (TIS) required for identifying the MRS as a repetitive external lift (REL) MRS to coincide with the nondestructive inspection (NDI) so that only one disassembly

of the shaft is required, which would reduce the down time required to disassemble the shaft. Also, this action proposes to extend the time required to replace the MRS.

This action also proposes to modify a paragraph in the AD that imposes a factor of 30 for unknown flight time. This has been changed to a factor of 13.6. This action proposes to add the determination of the shaft cycle count for the purpose of establishing the life limit. Also, this action proposes to allow additional Revision A service information that can be used to modify an REL MRS for its life limit determination.

We are reopening the comment period to allow the public to comment on these proposed changes.

Comments

We gave the public the opportunity to comment on the previous NPRM (73 FR 21556, April 22, 2008). The following presents the comments received on the NPRM, and the FAA's response to those comments.

Request

One commenter stated there was a difference between AD 98-26-02 and the NPRM in how many lifts constitute the shaft being REL. The commenter stated that a shaft that had 6 lifts per hour is REL under AD 98-26-02 but would not be considered REL (more than 6 lift cycles per hour) under the NPRM.

We agree. The proposed AD is changed to match AD 98-26-02. Those shafts that have 6 or more lifts per hour are REL shafts.

Two commenters commented on the requirement to identify the REL MRS. One commenter stated that the compliance time to identify the REL MRS should be extended from 5 hours to 10 hours. Another commenter asked if the identification of REL MRS on

the component history card would be sufficient and stated that the marking requirement of the REL MRS would require an extended down time and lost revenue.

We partially agree. We still believe the physical REL MRS should be identified and marking the component history card alone is insufficient. However, to avoid unnecessary down time, we are proposing to mark the MRS to coincide with the NDI at 1,100 hours TIS, at which time, the shaft would be disassembled anyway thus avoiding unnecessarily disassembling the MRS just to mark it.

One commenter stated that mentioning the identification of the TS-281 marking in the proposed “Note 2” could result in a serviceable MRS being rejected. The commenter further states that an MRS can have the TS-281 marking but not have oversized dowel pin holes.

We disagree. The proposed AD would not require all shafts marked with the TS-281 marking to be removed from service. Only those shafts that have oversized dowel pin bores would be required to be removed from service.

A commenter stated that compliance time (grace period) should be extended for the MRS over life limit because the steel plates referenced in the service information may not be available. Another commenter, the manufacturer, further stated that cycle limits should be added to the grace period.

We disagree. Providing a grace period within which to comply with a retirement life essentially extends the retirement life and would not be appropriate. Also, this AD does not mandate modifying the configuration using the steel plates in SB 61B35-53A, and therefore the availability of that part does not factor into the compliance times identified.

Another commenter stated that the lack of documented failures supports keeping the existing life limits in place and does not support the additional cycle limits to the MRS due to flawed testing. The commenter further stated that there have been no reported cracks in the MRS in the 9+ years since issuing AD 98-26-02. The commenter also stated that the life limits were generated using a flawed test program. Based on an approved Rotorcraft Flight Manual, the chart shows that at above 20 degrees Celsius and 1000-foot pressure altitude, the helicopter cannot produce 103 per cent torque. The capability of the helicopter reaching 103 percent torque was one of the reasons the commenter gave that the testing was flawed. Due to that capability, the testing at the 96 percent torque value was indicated to be more realistic (the test specimen lasted for longer than 1.4 million cycles). The second example of flawed testing given by the commenter was that using the 200,000 cycle in the presentation and without using the mean or working curve, the factor of 30 gives an equivalent time of over 6,660 flight hours. This would allow several 1000-hour inspections based on the overhaul manual to remove any of the fretting damage. Therefore, the fretting damage would have been repaired, resulting in a significant increase in cycles to failure.

We partially agree. During certain operations, the helicopter can reach 103 percent torque depending on the temperature and altitude adjustments. The ability of the helicopter to reach 103 percent torque was one of the reasons given for flawed testing. Based on logging surveys conducted by Sikorsky, the current usage spectrum of some operators exceeds those that generated the MRS life limits. However, there have been no new reported cracks. During the time histories of engine torque available during an operator logging survey, the 103 per cent engine torque was seen during those operations.

Because the torque value can be reached during logging operations, it is a realistic torque value for determining the new life limit.

The second example provided of flawed testing is based on inspecting the specimen by following the overhaul manual and repairing any damage. However, when performing fatigue tests for life limit certification of the helicopter, these tests are carried out for the life of the part without any stoppage for inspections or repairs. The allowable cycles are further reduced due to the limited number of test specimens to represent the manufacturing variability and other unknown factors. Therefore, those cycles are modified using a reduction factor to determine a life limit. Since the testing to determine life limits does not consider repairs, the testing performed was not flawed. Therefore, we are proposing to retain the new life limits.

The same commenter stated that the lack of documented failures supports keeping the existing life limits in place and does not support the additional cycle limits to the MRS because the 30,000 cycle limit would reduce the actual flight hour time to as low as 1,000 hours (using imposed 30 cycles per flight hour factor). The commenter further stated that the significant decrease in life limit from 2,200 hours to 1,000 hours is not justified.

We partially agree. Providing the factor of 30 to the unknown flight time to determine the component lift cycle count would reduce the existing life limit to below those of AD 98-26-02. Therefore, we are modifying the requirements by imposing a factor of 13.6 for the lift cycle count to the unknown flight time.

The manufacturer stated that we should require incorporating Customer Service Notice (CSN) 6135-10A and Alert Service Bulletin (ASB) 61B35-53A for unmodified

REL MRS and reference these instead of the prior revisions. The commenter further stated that we should require replacing the planetary assembly and MRS assembly attaching hardware with the high strength steel hardware for unmodified REL MRS because the titanium planetary plates have a history of cracks in REL operations.

We partially agree. The titanium plates continue to be airworthy so long as the compliance times for the unmodified REL MRS times are followed. Because they are still airworthy parts, incorporating CSN 6135-10A and ASB 61B35-53A, both dated April 29, 2004, will not be required for unmodified REL MRS. Operators continuing to use the unmodified REL MRS will continue to have a lower life limit as identified in AD 98-26-02 for the unmodified REL MRS in comparison to the life of a modified REL MRS. However, the later versions of the CSN and ASB (Revision A) will not be incorporated because that is unnecessary to correct the unsafe condition. The previous versions are equivalent to CSN 6135-10A and ASB 61B35-53A for determining a modified REL MRS configuration. Therefore, for modified REL MRS, we propose adding CSN 6135-10A and ASB 61B35-53A to provide credit for those modified by following the original ASB and CSN or revision A to those documents.

The manufacturer also stated that the compliance time (grace period) for the non-REL MRS should be reduced to 150 from 1500 hours TIS.

We disagree. Sikorsky issued ASB 61B35-69, which specified replacing a non-REL MRS at the next main gearbox overhaul or within 6 months. However, as these shafts have exceeded the life limit for the part, it should be replaced with an airworthy part. Therefore, we are proposing to remove the grace period

FAA's Determination

We are proposing this SNPRM because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other helicopters of these same type designs. Certain changes described above expand the scope of the original NPRM. As a result, we have determined that it is necessary to reopen the comment period to provide additional opportunity for the public to comment on this SNPRM.

Proposed AD Requirements

This proposed AD would retain some of the requirements from the current AD 98-26-02 (63 FR 69177, December 16, 1998): Recording the number of external lift cycles, determining whether the shaft is REL or non-REL, marking the REL shafts at the time of the NDI, and conducting an NDI for shafts used in REL operations and replacing it if a crack is found.

The proposed AD would also require calculating a 250-hour TIS moving average of lift cycles to determine whether the MRS is an REL MRS, determine a new retirement life for each MRS based on hour TIS and lift cycles, remove from service any MRS with oversized dowel pin bores, and expand the applicability to include certain restricted category models that were inadvertently omitted in the existing AD. Also, this proposed action would extend the retirement life of modified REL MRS from 2,200 hours TIS to 5,000 hours TIS but also implement lift-cycle retirement lives. Lastly, this action proposes allowing the use of Revision A service information to modify the REL MRS for life limit determination.

Costs of Compliance

We estimate that this proposed AD would affect 60 helicopters of U.S. registry. We estimate that operators may incur the following costs in order to comply with this proposed AD: It would take about 2.2 work hours to NDI an REL MRS at \$85 per work hour plus a \$50 consumable cost, for a total cost of \$237 per helicopter and \$14,220 for the U.S. fleet. It would take 2.2 work hours at \$85 per work hour to replace an MRS, and parts would cost \$44,753, for a total cost of \$44,940 per helicopter.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. "Subtitle VII: Aviation Programs," describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in "Subtitle VII, Part A, Subpart III, Section 44701: General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States,

or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed, I certify this proposed regulation:

1. Is not a “significant regulatory action” under Executive Order 12866;
2. Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979);
3. Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction; and
4. Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared an economic evaluation of the estimated costs to comply with this proposed AD and placed it in the AD docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by removing Amendment 39-10943 (63 FR 69177, December 16, 1998), and by adding the following new airworthiness directive (AD):

**SIKORSKY AIRCRAFT CORPORATION; CROMAN CORPORATION;
CARSON HELICOPTERS, INC.; GLACIER HELICOPTERS, INC.; ROBINSON
AIR CRANE, INC.; and SILLER HELICOPTERS:** Docket No. FAA-2008-0442;
Directorate Identifier 2007-SW-24-AD.

(a) Applicability.

This AD applies to Model S-61A, D, E, L, N, NM (serial number (S/N) 61454), R, V, CH-3C, CH-3E, HH-3C, HH-3E, SH-3A, and SH-3H helicopters with main rotor shaft (MRS), part number (P/N) S6135-20640-001, S6135-20640-002, or S6137-23040-001, installed, certificated in any category.

(b) Unsafe Condition.

This AD defines the unsafe condition as MRS structural failure, loss of power to the main rotor, and subsequent loss of control of the helicopter.

(c) Affected ADs.

This AD supersedes AD 98-26-02 (63 FR 69177, December 16, 1998), Amendment 39-10943, Docket No. 96-SW-29-AD.

(d) Comments Due Date.

We must receive comments by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

(e) Compliance.

You are responsible for performing each action required by this AD within the specified compliance time unless it has already been accomplished prior to that time.

(f) Required Actions.

(1) Within 10 hours time-in-service (TIS):

- (i) Create a component history card or equivalent record for each MRS.
 - (ii) If there is no record of the hours TIS on an individual MRS, substitute the helicopter's hours TIS.
 - (iii) If the record of lift cycles on an individual MRS is incomplete, add the known number of lift cycles to a number calculated by multiplying the number of hours TIS of the individual MRS by the average lift cycles calculated according to the instructions in Section I of Appendix I of this AD or by a factor of 13.6, whichever is higher.
 - (iv) At the end of each day's operations, record the number of external lift cycles (lift cycles) performed and the hours TIS. An external lift cycle is defined as a flight cycle in which an external load is picked up, the helicopter is repositioned (through flight or hover), and the helicopter hovers and releases the load and departs or lands and departs.
- (2) Within 250 hours TIS, determine whether the MRS is a repetitive external lift (REL) or non-REL MRS.
- (i) Calculate the first moving average of lift cycles by following the instructions in Section I of Appendix I of this AD.
 - (A) If the calculation results in 6 or more lift cycles per hour TIS, the MRS is an REL-MRS.
 - (B) If the calculation results in less than 6 lift cycles per hour TIS, the MRS is a Non-REL MRS.
 - (ii) If the MRS is a Non-REL MRS based on the calculation performed in accordance with paragraph (e)(2)(i), thereafter at intervals of 50 hour TIS, recalculate the

average lift cycles per hour TIS by following the instructions in Section II of Appendix 1 of this AD.

(iii) Once an MRS is determined to be an REL MRS, you no longer need to perform the 250-hour TIS moving average calculation, but you must continue to count and record the lift cycles and number of hours TIS.

(iv) If an MRS is determined to be an REL MRS, it remains an REL MRS for the rest of its service life and is subject to the retirement times for an REL MRS.

(3) Within 1,100 hours TIS:

(i) Conduct a Non-Destructive Inspection for a crack on each MRS. If there is a crack in an MRS, before further flight, replace it with an airworthy MRS.

(ii) If an MRS is determined to be an REL MRS, identify it as an REL MRS by etching "REL" on the outside diameter of the MRS near the part S/N by following the Accomplishment Instructions, paragraph 3.C., of Sikorsky Alert Service Bulletin (ASB) 61B35-69, dated April 19, 2004.

(4) Replace each MRS with an airworthy MRS on or before reaching the revised retirement life as follows:

(i) For an REL MRS that is not modified by following Sikorsky Customer Service Notice (CSN) 6135-10, dated March 18, 1987, and ASB No. 61B35-53, dated December 2, 1981 (unmodified REL MRS), the retirement life is 30,000 lift cycles or 1,500 hours TIS, whichever occurs first.

(ii) For an REL MRS that is modified by following Sikorsky CSN 6135-10, dated March 18, 1987, and Sikorsky ASB No. 61B35-53 dated December 2, 1981, or CSN 6135-10A, Revision A, and ASB 61B35-53A, Revision A, both dated April 19, 2004

(modified REL MRS), the retirement life is 30,000 lift cycles or 5,000 hours TIS, whichever occurs first.

(iii) For a non-REL MRS, the retirement life is 13,000 hours TIS.

(5) Establish or revise the retirement lives of the MRS as indicated in paragraphs (e)(4)(i) through (e)(4)(iii) of this AD by recording the new or revised retirement life on the MRS component history card or equivalent record.

(6) Within 50 hours TIS, remove from service any MRS with oversized (0.8860” or greater diameter) dowel pin bores.

(g) Alternative Methods of Compliance (AMOCs).

(1) The Manager, Boston Aircraft Certification Office, FAA, may approve AMOCs for this AD. Send your proposal to Jeffrey Lee, Aviation Safety Engineer, Boston Aircraft Certification Office, 12 New England Executive Park, Burlington, MA 01803, telephone (781) 238-7161, fax (781) 238-7170, email jeffrey.lee@faa.gov.

(2) For operations conducted under 14 CFR part 119 operating certificate or under 14 CFR part 91, subpart K, we suggest that you notify your principal inspector, or lacking a principal inspector, the manager of the local flight standards district office or certificate holding district office before operating any aircraft complying with this AD through an AMOC.

(h) Additional Information.

(1) Sikorsky Aircraft Corporation issued an All Operators Letter (AOL) CCS-61-AOL-04-0005, dated May 18, 2004, with an example and additional information about tracking cycles and the moving average procedure. This AOL is not incorporated by reference but contains additional information about the subject of this AD.

(2) The Overhaul and Repair Instruction (ORI) Number 6135-281, Part B, Step 5, and ORI 6137-041, Section III, Oversize Dowel Pin Bore Repair and identified on the flange as TS-281 or TS-041-3, which is not incorporated by reference, contains additional information about the subject of this AD.

(3) For more information about the AOL or the ORI, contact Sikorsky Aircraft Corporation, Attn: Manager, Commercial Technical Support, mailstop s581a, 6900 Main Street, Stratford, CT, telephone (203) 383-4866, e-mail address tsslibrary@sikorsky.com, or at <http://www.sikorsky.com>. You may review a copy of the referenced service information at the FAA, Office of the Regional Counsel, 2601 Meacham Blvd., Room 663, Fort Worth, Texas 76137.

APPENDIX I

SECTION I: The first moving average of lift cycles per hour TIS

The first moving average calculation is performed on the MRS assembly when the external lift component history card record reflects that the MRS assembly has reached its first 250 hours TIS. To perform the calculation, divide the total number of lift cycles performed during the first 250 hours TIS by 250. The result will be the first moving average calculation of lift cycles per hour TIS.

SECTION II: Subsequent moving average of lift cycles per hour TIS

Subsequent moving average calculations are performed on the MRS assembly at intervals of 50 hour TIS after the first moving average calculation. Subtract the total number of lift cycles performed during the first 50-hour TIS interval used in the previous moving average calculation from the total number of lift cycles performed on the MRS assembly during the previous 300 hours TIS. Divide this result by 250. The result will be the next or subsequent moving average calculation of lift cycles per hour TIS.

SECTION III: Sample calculation for subsequent 50 hour TIS intervals

Assume the total number of lift cycles for the first 50 hour TIS interval used in the previous moving average calculation = 450 lift cycles and the total number of lift cycles for the previous 300 hours TIS = 2700 lift cycles. The subsequent moving average of lift cycles per hour TIS = $(2700 - 450) \text{ divided by } 250 = 9 \text{ lift cycles per hour TIS}$.

(i) Subject.

Joint Aircraft Service Component (JASC) Code: 6320, Main Rotor Gearbox.

Issued in Fort Worth, Texas, on April 16, 2013.

Lance T. Gant,

Acting Manager, Rotorcraft Directorate,
Aircraft Certification Service.

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